Remarks/Arguments

Reconsideration of this application is requested.

The Examiner has objected to the abstract. Applicant has reformatted the abstract so that the abstract is a single prargraph continuing the same words as the abstract amended on August 22, 2005.

Claims 1 and 2 have been rejected by the Examiner under 35 USC §103(a) as being unpatentable over Rhoads (U.S. Patent No. 6,636,615), in view of Cass et. al. (U.S. Patent No. 5,946,414.

Rhoads discloses the following in lines 20-37 of column 4.

> "The document **10** includes an image (not explicitly shown) that has two digital watermarks inserted therein. In the first embodiment of the invention, the first watermark has a fine grain arid the second watermark has a course grain. The grain of the two watermarks is illustrated in FIG. 2 FIG 2A shows the grain of the first watermark and FIG. 2B shows the grain of the second watermark. The first watermark uses blocks of 9 pixels (a 3 by 3 block). Each of the pixels in each 9 pixel block has its gray value changed by the same amount. For example FIG. 2A shows that the first 9 pixel block has its gray value increase and the second 9 pixel block has its gray value decreased. The amount of increase and the selection of blocks that is increased and decreased is conventional."
>
> As shown in FIG. 2B, the grain of the second watermark is in blocks that are 6 pixels by 6 pixels or 36 pixels. All of the pixels in each 36 pixel block are changed by the same amount."

Rhoads discloses the following in line 56 of column 4 to line 15 of column 5.

> "FIGS. 3A and 3B show an alternative technique for implementing the present invention. In the second embodiment of the invention, the two watermarks inserted into the image on a document have different patterns of assigning pixels to the bits of the payload represented by the watermark. The first watermark utilizes a geometrically linear assignment of pixels to each bit. For example FIG. 3A shows an image that ahs 500 by 500 pixels. Considering a watermark payload with 50 bits, each bit of the watermark would have 5000 pixels assigned to represent that bit. A linear assignment could have each fifth bit in each row (100 bits per row) and each fifth row (50 rows) assigned to each bit of the watermark.

> Thus 5000 pixels would be assigned to each bit in a very orderly or linear manner.
> In the second watermark the pixels would be assigned to each bit in a random manner as shown in FIG. 3B. Each bit in the watermark would still have 5000 assigned bits; however, the pixels would be a random location over the image. Naturally it should be understood that FIG. 3A and 3B illustrate how pixels are assigned to one bit of the watermark. The other bits of the watermarks would have pixels assigned in a similar manner.
> Similar to the first embodiment of the invention, the watermark with a linear assignment of pixels and the watermark with a random assignment of pixels would be affected differently by handling and wear on the original document than they would be by being scanned and reprinted."

Rhoads modifies an image by embedding a watermark in an image.

Rhoads is watermarking a continuous tone.

Cass discloses the following in lines 56-67 of col. 14.

> "Before oproceeding with the description of the invention, it is useful to provide definitions and clarification of some of the terminology used herein; this terminology is discussed with reference to FIG. **48**. It was noted above that a signal blaock has dimensions of KxK expressed in units called "color cells." In the context of this invention, a "printer cell" is the smallest unit of of the absence or presence of a mark on a printed medium. FIG. **48** shows a small, substantially solid filled, uniformly sized circles representing printer cells, such as peinter cell **342**. In a black and white printer a printer cell is approximately a single printer spot."

Applicant's claims in claim 1 and those claims dependent thereon a different and non obvious invention than that disclosed by Rhoads and/or Cass. Rhoads and/or Cass do not disclose or anticipate the following steps of claim 1, namely representing the first binary array as a first set of modules of a first size of n x n pixels wherein each pixel is either white or black and every pixel in the module is identical to every other pixel in the module on nodes of a first lattice; and representing the second binary array as a second set of modules of a second size, of m x m wherein each pixel is either white or black and every pixel in the module is identical to every other pixel in the module which is smaller than the first size on nodes of a second lattice; combining the first and second sets of modules.

Cass discloses individual printer cells 342 that are black and white or color. Thus, Cass does not disclose or anticipate an array of printer cells (pixels) that are n x n where n is at least 2 cells (pixels) since m is smaller than n.

Claim 3 has been rejected by the Examiner under 35 USC §103(a) as being unpatentable over Rhoads (U.S. Patent No. 6,636,615) in view of Cass et. al. (U.S. Patent No. 5,946,414) and further in view of Leon (Pub. No. US 2003/0028497 A1).

While it is true that Leon discloses a postal indicia, the cited art does not disclose or anticipate the following steps of claim 1, namely representing the first binary array as a first set of modules of a first size on nodes of a first lattice; representing the second binary array as a second set of modules of a of m x m wherein each pixel is either white or black and every pixel in the module is identical to every other pixel in the module second size, which is smaller than the first size on nodes of a second lattice; combining the first and second sets of modules.

Claims 5-8 have been rejected by the Examiner under 35 USC § 103(a) as being unpatentable over Muratani (U.S. Patent No. 6,768,807B1) in view of Roberts (U.S. Patent No. 6,882,442B2), and Rhoads (Pub. No. U.S. 2004/0264735 A1).

Muratani discloses the following in line 28-47 of Column 5.

> "The first digital watermark embedding device by which digital data is assumed to be an embedding target and the digital watermark is embedded, according to the present invention is characterized by comprising: spread spectrum means to set said embedding target to be a unit spreading block which performs the spread spectrum of the spreading block in which said embedding target includes more than two adjacent basic unit of each bases which constructs the plurality of basic units, multiplies the same pseudo-random number signal is multiplied to said embedding target more than two said basic units in said unit spreading block, and watermark embedding means to embed the digital watermark information embedded by the direct sequence spread spectrum method can be prevented being distributed to the high frequency region in the inverse spread spectrum processing, in addition, digital watermark information can not be easily disappeared."

Muratani discloses the following in Column 20 lines 1-9.

> "Embedded position selection section 81 decides the position in the frequency domain where watermark information should be embedded without depending on the frequency component value

(embedded position). In the following explanation, it is assumed that the embedded position (u, v) is one point, and and it is also possible to set a plurality of points embedded positions. In that case, embedded position selection section 81 gives set Sf of embedded position (u, v) in the frequency domain."

Muratani discloses the following in column 20 lines 29-48.

"In addition, to avoid the beating between watermark information embedded in two or more positions, the embedded position may be decided in embedded position selection section 81. For example, when the plurality of embedded positions generated with random numbers has a turning value with the same point and the neighborhood point in the pixel value domain, it might be able to be recognized when overlap of a turning value becomes an area having one dimension or two-dimensional extensions but not at one point. Then, the function to judge whether such a beating is occurred between plurality of embedded positions to embedded position selection section 81 is provided, the validity of the candidate is judged by this judgment function every time the candidate in the embedded position is generated, a corresponding candidate is abandoned when judged an improper candidate, and the configuration which selects it as an element of set Sf of the embedded position may be added when judged an appropriate candidate."

Roberts discloses the following in lines 6-30 of column 19.

"Where a plurality of remote users access and print coupons from a variety of remote station configurations having a variety of printer types, the particular resolution associated with each such printer type may vary widely. Inaccuracies arise when the pixel width of a barcode image does not match or align with the available pixels in a defined width based on a given printer's resolution.

A very basic example of this is illustrated in the series of FIGS. 11A-11D, wherein a barcode 200 has a pixel width PW of two and the bar code comprises one black stripe 202 adjacent one white stripe 204. For a given printer having a resolution of 3, the prior art methods would stretch the image by a factor of 1.5 and every third pixel column would be interpolated to generate print information. This misalignment factor of 3 is arrived at be taking the print area width,3 , and dividing by the difference(3-2=1) between the print area,3 , and the bar code pixel width,2 . The prior art rendering methods would result in a printed image having one of the following bar sequences: 1) black, gray, white, FIG.11B; 2) black, black, white, FIG. 11C; or 3) black, white, white, FIG. 11D. In all three of these resulting stripe sequences the printed image is

> an inaccurate representation of the original bar code data and the bar code reader will detect the inaccuracies and the decoder will compile inaccurate data therefrom."

Rhoads discloses the following in Paragraphs 0050-0052 of (Pub. No. US 2004/0264735 A1).

> "[0050] In the foregoing techniques, it is sometimes necessary to trade-off the tweak values of adjoining regions. For example , a line may pass along a border between regions, or pass through the point equidistant from four grid points ("equidistant zones"). In such cases, the line may be subject to conflicting tweak values-one region may want to increase the line width, while the another may want to decrease the line width. (Or both may want to increase the line width, but differing amounts.) Similarilyin cases where the line does not pass through an equidistant zone, but the change in line width is a function of a neighborhood of regions whose tweaks are different values. Again, known interpolation functions can be employed to determine the weight to be given the tweak from each region in determining what change is to be made to the line width in any given region.
> [0051] In the exemplary watermarking algorithm, the average change in luminosity across the security document image is zero, so no generalized lightening or darkening of the image is apparent. The localized changes in luminosity are so minute in magnitude, and localized in position, that they are essentially invisible (e.g. inconspicuous/subliminal) to human viewers.
> [0052] An alternative technique is shown in **FIG.6**, in which line position is changed rather than line width."

Neither Muratani or Roberts or Rhoads taken separately or together disclose or anticipate the following step of claim 5, namely applying a spreading algorithm to the first part and second part to scramble the information to further hide the information in the first and second parts in a manner that the spreading algorithm will move pixels in the first image and the second image so that the moved pixels will not be close together

The cited references transform the image in a different manner than that claimed by applicants.

Claims 9-17 have been rejected by the Examiner under 35 USC §103(a) as being unpatentable over Muratani (U.S. Patent No. 6,768,807B1), Roberts (U.S. Patent No. 6,882,442B2) and Rhoads (Pub. No. U.S. 2001/0022848A1) and further in view of Rhoads (U.S. Patent No. 6,636,615).

The cited references do not disclose or anticipate the following step of claim 5 namely applying a spreading algorithm to the first part and second part to scramble the information further hide the information in the first and second parts in a manner that the spreading algorithm will move pixels in the first image and the second image so that the moved pixels will not be close together.

In view of the above claims 1-17 are patentable. If the Examiner has any questions would the Examiner please call the undersigned at the telephone number noted below.

Respectfully submitted,

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